REMARKS

This Response is submitted in reply to the non-final office action mailed May 16, 2007. Claims 1-24 (Claims 25-48 as of the Preliminary Amendment dated 7/27/04) are pending in this application. Applicants kindly the Patent Office for discussing this case with the undersigned attorney of record in the scheduled Examiner interview via telephone on July 26, 2007. Applicants believe that this response is consistent with those discussions.

Hereinafter, Applicants will refer to the claims as numbered in the Preliminary Amendment. Claims 25-31, 33, 34, and 42-48 are rejected under 35 U.S.C. §102. Claims 32 and 35-41 are rejected under 35 U.S.C. §103. In response, Claims 25-48 are canceled and new Claims 49-69 are added. No fee is due in connection with this Response. The Director is authorized to charge any fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 112857-373 on the account statement.

Of new Claims 49-69, Claim 49 is an amended version of canceled Claim 25; Claim 50 corresponds to canceled Claim 26; Claim 51-62 correspond to canceled Claims 28-39 with Claim 54 being an amended version of canceled Claim 31; Claim 63 is an amended version of canceled Claim 40, Claim 64 corresponds to canceled Claim 41; Claim 65 is an amended version of canceled Claim 44; and Claims 66-69 correspond to canceled Claims 45-48 with Claim 68 being an amended version of canceled Claim 47.

In the Office Action, Claims 25-31, 33, 34, and 42-48 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 6,171,368 to Maget et al. ("*Maget*"). First, no new independent claims mirror canceled independent Claim 42. Next, independent Claims 49 recites, in relevant part, a gas pressure regulator comprising a high pressure vessel disposed on a first side of the electrochemical cell; a low pressure vessel disposed on a second side of the electrochemical cell; and a hydrogen gas reservoir connected to the high pressure vessel and the low pressure vessel. Since Claim 49 is an amended version of canceled Claim 25, the amended portion is supported in the US Patent Publication 2005/0077172 ("specification") at page 3, [0056]. Applicants respectfully submit that *Maget* fails to disclose or suggest every element of independent Claim 49.

For example, *Maget* fails to disclose or suggest a hydrogen gas reservoir connected to a high pressure vessel as required by Claim 49. In fact, *Maget* fails to even disclose a hydrogen

gas reservoir. Instead, *Maget* is directed to purely extracting gases from closed containers, wherein extracting occurs when containers are at high pressure until the containers reach a lower pressure level, at which time the extractor stops operating. See, *Maget,* Abstract. Consequently, while *Maget* may show the ability to extract or reduce pressure of a high pressure system or vessel, the reference shows no capability to supply hydrogen to the high pressure system, as in the present claims.

Further, *Maget* fails to disclose or suggest a gas pressure regulator as required, in part, by independent Claim 49. Rather, as stated above, *Maget* is directed to gas extraction from closed containers using an extractor, meaning that gas can travel in only one direction, specifically from within a closed container to without. See, for example, *Maget,* Title; Abstract; column 5, lines 14-16, 20-25 and 32-34. The difference is significant, as the present claims allow the gas pressure regulator to operate as a pressure reducing and pressurizing device, thus allowing gas to flow in either direction relative to the location of the high pressure vessel. See, specification, page 1, [0015-0018]. Moreover, the present claims describe a means supplying control current to both the ends of the first electrode and the second electrode, wherein a quantity of the control current is controlled to control the flow rate of gas flowing across both the electrodes. See, specification, page 8, [0131] and Claim 2.

Independent Claim 65 recites, in relevant part, a method for regulating gas pressure comprising supplying hydrogen gas from a hydrogen supply tank to a high pressure gas storage tank adjacent a first electrode. Since Claim 65 is an amended version of canceled Claim 44, the amended portion is supported in the specification at page 7, [0120]. Applicants respectfully submit that *Maget* fails to disclose or suggest a hydrogen gas reservoir supplying hydrogen gas to a high pressure vessel as required by Claim 65. As previously stated, *Maget* fails to even disclose a hydrogen gas reservoir. Instead, *Maget* is directed to purely extracting gases from closed containers, wherein extracting occurs when containers are at high pressure until the containers reach a lower pressure level, at which time the extractor stops operating. See, *Maget,* Abstract. Consequently, while *Maget* may show the ability to extract or reduce pressure of a high pressure system or vessel, the reference shows no capability to supply hydrogen to the high pressure system, as is required by the present claims.

Further, Applicants respectfully submit that *Maget* fails to disclose or suggest a gas pressure regulating method. Instead, as discussed above, *Maget* discloses a gas extraction

method which only allows for the removal of gas from a container. By contrast to *Maget*, Applicants gas pressure regulating method allows for gas discharging and pressurizing of a container. This is accomplished, for example, by supplying a control current to both the ends of a first and second electrode to control a quantity of the control current so that the flow rate of gas flowing across both the electrodes is controlled. See, specification, page 8, [0131] and Claim 21.

Finally, *Maget* teaches away from the claimed invention. For example, Applicants disclose that the usual gas regulator merely intends to reduce the pressure of gas and is only provided with a pressure reducing mechanism. See, specification, page 1, [0008]. Likewise, *Maget* discloses a gas extractor that, much like the usual gas regulator noted above, reduces pressure in a system. As a result, Applicants recognize the need for a pressurizing mechanism provided separately from the pressure reducing mechanism in order to apply pressure. See, specification, page 1, [0008]. Applicants meet this need through one device formed so as to have a pressure reducing mechanism and a pressure applying mechanism, resulting in a more compact device than a usual gas regulator. See, specification, page 1, [0018].

For at least the reasons discussed above, the *Maget* fails to teach, suggest, or even disclose every element of the present claims, and thus, fails to anticipate the claimed subject matter.

Accordingly, Applicants respectfully request that the anticipation rejections with respect to Claims 25-31, 33, 34, and 42-48 be reconsidered and the rejections be withdrawn.

In the Office Action, Claim 32 (new 55) is rejected under 35 U.S.C. 103(a) as being unpatentable over *Maget* as applied to claim 25 (new 49) and further in view of U.S. Patent 6,685,821 to Kosek et al. ("*Kosek*"). Since the Office Action relies on *Kosek* only with regard to elements of dependent Claim 32 (new 55), *Kosek* fails to remedy the deficiencies of *Maget*.

In the Office Action, Claims 35-41 (new 58-64) are rejected under 35 U.S.C. 103(a) as being unpatentable over *Maget* as applied to Claim 25 (new 49) and further in view of WO 01/06519 to Hinokuma et al. ("*Hinokuma*"). Since the Office Action relies on *Hinokuma* only with regard to elements of dependent Claims 35-39 and 41 (new 58-62 and 64), *Hinokuma* fails to remedy the deficiencies of *Maget*.

In the Office Action, Claims 40-41 (new 63-64) are rejected under 35 U.S.C. 103(a) as being unpatentable over *Maget* in view of U.S. Patent 6,218,035 to Fuglevand et al. ("*Fuglevand*"). Since new independent Claim 63 is an amended version of canceled independent

Claim 40, independent Claim 63 recites, in part, an electrochemical device comprising an electrochemical cell including a first electrode for decomposing a hydrogen gas into one or more protons, a second electrode for converting the protons generated in the first electrode into the hydrogen gas again and a proton conductor sandwiched in between both the electrodes; and a high pressure vessel disposed in a first electrode side of the electrochemical cell to accommodate a gaseous material including the hydrogen gas, wherein the high pressure vessel is connected to a hydrogen supply tank. Applicants respectfully submit that, even if combinable, the cited references fail to disclose or suggest every element of the present claims.

For example, *Maget* fails to disclose or suggest an electrochemical cell comprising a high pressure vessel that is connected to a hydrogen supply tank. Rather, as stated in the above §102 rejection response, *Maget* fails to even disclose a hydrogen gas reservoir. Instead, *Maget* is directed to purely extracting gases from closed containers, wherein extracting occurs when containers are at high pressure until the containers reach a lower pressure level, at which time the extractor stops operating. See, *Maget,* Abstract. Consequently, while *Maget* may show the ability to extract or reduce pressure of a high pressure system or vessel, the reference shows no capability to supply hydrogen to the high pressure system, as is required by the present claims. *Fuglevand* fails to remedy this deficiency because the reference provides no description regarding hydrogen fueling or a hydrogen reservoir. Rather, *Fuglevand* is particularly limited to just a fuel cell rather than the fuel cell as a portion of another invention, such as the gas pressure regulator of the present claims.

Further, *Maget* fails to disclose or suggest an electrochemical cell including a first electrode, a second electrode, and a proton conductor sandwiched in between both the electrodes. Rather, *Maget* discloses only a membrane that allows ionic species to pass through it. According to *Maget*, the ionic species are induced to cross the membrane by reduction or oxidation of the gaseous contaminant occurring on the container side of the electrochemical cell. See, *Maget*, column 5, lines 7-11. In contrast to *Maget*, the proton conductor of the present claims promotes movement of protons across the membrane by employing specific derivatives.

For example, when fullerenol (combination of a plurality of hydroxyl groups and fullerene molecules) is used as an aggregate, it exhibits high proton conductive characteristics. Another example includes the aggregation of fullerenol and hydrogensulfate esterified fullerenol. In this case, the proton conductivity shown by the aggregation is directly related to the proton

movement derived from a large quantity of hydroxyl groups or OSO_3H groups. See, Preliminary Amendment, page 13, lines 8-14 and 23-28. Moreover, the fullerene constituting the base of these molecules especially has electrophilic characteristics, which greatly contributes to the acceleration of electrolytic dissociation of hydrogen ions not only in OSO_3H groups, but also hydroxyl groups and exhibits excellent proton conductivity. Since relatively large quantities of hydroxyl groups and OSO_3H groups can be introduced to on fullerene molecule, the density of the proton conductor related to conduction per unit volume becomes very high. Thus, a substantial conductivity is realized. See, specification, page 13, line 29 to page 14, line 5. Based on these examples, it is clear that the proton conductor of the present claims exists to promote proton movement in contrast to *Maget*.

Fuglevand fails to remedy the above deficiencies of *Maget*. While *Fuglevand* may disclose a proton exchange membrane (PEM) made up of a polymerized electrolyte, the reference still fails to disclose any form of a proton conductor or a membrane having proton conductive properties. Rather, *Fuglevand* asserts that protons simply pass through the membrane without any indication that the membrane induces movement of protons. See, *Fuglevand*, column 2, lines 13-15. As discussed at length above, the present claims employ a proton conductor through the use of certain molecules, or aggregates of molecules, designed specifically for proton conductivity.

Accordingly, Applicants respectfully request that the obviousness rejections with respect to Claims 32 and 35-41 be reconsidered and the rejections be withdrawn.

In the Office Action, the disclosure is objected to because of alleged improper arrangement of the specification. In view of 35 U.S.C. §1.77(b-c), Applicants respectfully submit that the specification, and sections included therein, sufficiently meets the order and arrangement recommended by the Patent Office. Accordingly, Applicants respectfully request that this informality objection be reconsidered and withdrawn.

In the scheduled Examiner interview as discussed above, the Examiners identified U.S. Patent No. 5,788,682 (Maget II) as a potentially relevant reference to this case. Applicants are submitting an IDS citing this patent for examination on the merits.

Further, Applicants believe that the presently pending claims are patentable over this reference. For example, the presently pending claims are generally directed to regulating the flow of hydrogen to be used, for example, as a hydrogen source in an electrochemical device as

further defined in claims 63 and 64. In contrast, the focus of Maget II relates to a device for promotion of human or animal wound healing by controlling oxygen concentration in the environment around the wound. See, Maget II, Abstract, for example.

For the foregoing reasons, Applicants respectfully submit that the present application is in condition for allowance and earnestly solicit reconsideration of same.

Respectfully submitted,

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